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activities to and from Hungary, 2003–2011**

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Escaping to the East? Relocation of business activities to and from Hungary, 2003–2011

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Abstract

While the increased frequency of relocation of productive capacities to lower wage countries from developed economies has given rise to discussions concerning job losses and de-industrialisation, developments in the host countries of relocation have been widely neglected. Hungary, together with other new EU member countries, is one of the net beneficiary countries of relocation especially from the developed EU-15 countries. Macro-data can be used only to a limited extent to describe the complex phenomenon of relocation; case study evidence and company level analysis can shed light on details and short-term changes. We compiled a comprehensive relocation database in Hungary for the nine-year period between 2003 and 2011. In this paper we analyse this database and compare the results with those of the literature. We shed light on details concerning the nationality of relocating companies, the sectors and foreign locations affected and the job creation/loss impact. Finally we discuss the effects of the recent crisis when the number of greenfield investment projects declined, but the number of relocations to Hungary increased.

Keywords: relocation, Hungary, multinational corporations, offshoring, offshore outsourcing, crisis

JEL classification: F21, F23

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Menekülés Keletre? Relokációk Magyarországra és Magyarországról 2003–2011 között

Sass Magdolna – Hunya Gábor

Összefoglaló

Míg a fejlett országokból a termelési kapacitások alacsonyabb bérű országokba történő áthelyezésének gyakoribbá válása és az ehhez kapcsolódó munkahelyvesztés és deindusztrializáció élénk vitákat váltott ki, addig nagyon kevesen elemzik a relokációkat fogadó országokban tapasztalt változásokat. Magyarország – más új EU-tagországokkal együtt – a relokációk nettó fogadó országa, különösen az EU-15-ből származó termelésáthelyezések esetében. A makroadatok csak korlátozottan használhatók a relokáció komplex folyamatainak elemzésére. Vállalati esettanulmányok fontos részletekkel szolgálhatnak és jelzik a rövid távú változásokat is. A 2003 és 2011 közötti időszakra állítottunk össze egy komplex relokációs adatbázist. Ebben a tanulmányban ezt elemezzük, és eredményeinket egybevetjük a szakirodaloméval. Adatbázisunk alapján elemezzük a relokáló vállalatok nemzetiségét, a munkahelyteremtés/vesztés legfontosabb ágazatait és az érintett külföldi telephelyeket. Végül elemezzük a válság hatását, amikor a zöldmezős beruházások csökkenését a Magyarországra irányuló relokációk növekedése kíséri.

Tárgyszavak: relokáció, Magyarország, multinacionális vállalatok, offshoring, offshore outsourcing, válság

JEL kód: F21, F23

1. INTRODUCTION

There is quite a chaos in terminology related to outsourcing, offshoring and relocation (Bhagwati et al. 2004). The phenomenon of international sourcing has a variety of labels and terms often used without explicit definitions: off-shoring, near-shoring, delocalization, outsourcing. International sourcing occurs both from affiliated and non-affiliated enterprise. Of these the former involves FDI while both forms boost international trade. We define relocation as foreign offshoring of business activities of firms (OECD, 2004; UNCTAD, 2004; Kirkegaard, 2005). Offshoring refers to a company's transfer of certain activities, which were hitherto carried out inside the company in one country, to another unit of the firm in a foreign location. Thus we use the term in its narrow sense where offshoring takes place to an affiliated unit (also called intra-firm or captive offshoring).

According to the above definition, relocation is an offshoring in which capacities are moved from the home to the host country by a multinational firm. The company terminates the production of some goods, components or services in the home country, transfers the capacities in another country and imports (or exports to other markets) the given product from that foreign subsidiary. This relocation generates FDI and international trade (Hunya and Sass, 2005). The main motivation of relocation is to reduce cost and thus increase competitiveness by splitting production and services between various locations. Thus comparative advantages of several locations, domestic and foreign alike are combined. Relocation is thus a form of efficiency-seeking or vertically integrated FDI.

The main research question of this paper is to identify the characteristics of relocation to and from Hungary: assess its frequency, sector of activity, home and host countries. We rely on a database specially set up for this research which provides information on the general characteristics and also allows for discussing specific cases of relocation. We are encouraged to refrain from going beyond a descriptive work by the lack of generally available relocation data and related literature. Previous studies rely on various proxies in order to determine the characteristics of relocations; with the exception of the very few papers relying on survey data (see e.g. Jensen et al., 2006 on Denmark.) Thus the added value of our paper lies in showing up new evidence on relocation and digging into its detailed characteristics. This approach is further justified by the relatively small number of observations in our database, which does not allow econometric analysis.

The paper is organised as follows. In section 2 we provide an overview of recent outsourcing and relocation trends in Europe. Then, the applied methodology is described and justified through relating it to other methodological approaches. In section 4 the

database on relocations to and from Hungary is analysed identifying the specific characteristics of relocations affecting Hungary and relating them to the results of the literature. Section 5 deals with the specific impact of the recent crisis on relocation in general and specifically in Hungary. The final section concludes.

2. THEORETICAL FRAMEWORK AND TRENDS IN CORPORATE INTERNATIONALIZATION AND RELOCATIONS

Internationalization of business has been one of the main developments of the past two decades. As a consequence, the corporate structure of the world economy has become significantly different from what it was in 1990. The volume of world trade and especially of FDI expanded more rapidly than GDP. This growth was seldom interrupted by regional, sectoral or global setbacks. The global expansion of direct investment was supported by institutional changes facilitating a freer move of goods and capital between countries. The collapse of the Soviet Bloc made it possible that almost all countries in the world have been integrated into the global system of trade and FDI. Trade rose also due to production sharing between stages of production in corporate networks and between subsidiary structures, which has been realised to a large extent through relocation of production capacities.

Relocation is a way of reducing costs thus increasing competitiveness by splitting production and services internationally between locations with different cost levels. Thus the comparative advantages of several countries are combined. Relocation implies that jobs, products and services are moved from the home to the host country. The company terminates the production of some goods or components in the home country and imports it from a foreign subsidiary. By doing so, it generates FDI and international trade.

In the FDI literature, relocation is identified as efficiency seeking or vertically integrated FDI, as opposed to market seeking or horizontally integrated FDI. Distinguishing these two types of FDI are older than the current debate on relocation. Export-oriented subsidiaries are set up by a vertically integrated multinational company in a host country with the aim to lower production costs or to seek, secure and diversify resources (Narula and Dunning 2000). Local market-oriented FDI is set up by horizontally integrated multinationals to penetrate a market, increasing market share, diversifying the source of sale, and minimising competition risk (Zhang and Markusen 1999).

International sourcing (also called vertical specialization), computed based on input-output tables as the intermediate imports content of exports, grew in almost all of the major exporting countries in 1990–2005 (Gotart, Görg and Görlich, 2009). They show that the

contribution of international sourcing has been small in the case of larger countries, but close to 50% in the Netherlands and almost 60% for Ireland in 2005. Vertical specialization has been most intensive within larger trading blocks, while even there internationalization affected only a small part of the companies. The vast majority of companies in most countries do not trade internationally and even less of them invest across borders. The report on this subject by the research network European Firms and International Markets (EFIM) (Mayer and Ottaviano, 2007) reveals that European firms involved in international activities are few in number and they are larger and more productive than other firms; foreign owned firms are more frequently exporters than domestic firms; firms involved in both trade and FDI are usually more productive than the rest of the firms in each industry. From another aspect, the relatively small number of internationalized firms is considered by the EFIM authors as the most important constraint on European trade and FDI performance. They also show that this situation hardly changes over time; the increase of exports or of FDI is usually achieved by the same firms, rarely by new firms. The scarcity of exporters and investors (Mayer and Ottaviano, 2007) increases with the distance to foreign markets; more difficult markets are exported to by fewer and larger firms and even more frequently by FDI firms. The relatively limited scope of captive outsourcing is confirmed by Geishecker, Görg and Taglioni (2008) showing that in 2004 only 3% of the more than two hundred thousand euro-zone firms in the Amadeus database had at least one foreign subsidiary and these were mostly inside Europe. Reference can be made here to the role of distance and sunk costs that are relatively high for entering countries with lower level of development (Helpman et al., 2004). This explains the specific obstacles companies have to cope with when doing business on far-away markets. For success they need a larger capital base management skills and superior productivity. In a follow-up project to EFIM, the EU-EFIGE (European Firms in a Global Economy) project Navaretti, Bugamelli, Ottaviano, Schivardi, Horgos and Maggioni (2010) conclude that firm characteristics are more important than country characteristics in explaining exports and FDI.

Another string of literature investigates trends in outsourcing to foreign firms or to affiliate enterprises abroad (making no distinction of captive outsourcing/offshoring). Shifting jobs to lower cost locations is seen as a driver and simultaneously a result of globalization. As an early attempt, Pennings and Sleuwaegen (2000) analysed the determinants of international relocation on the basis of Belgian data and found, that labour intensive firms tend to relocate more than capital intensive ones, reinforcing the importance of lower labour costs. Moreover, access to global networks, size of the firm and the rate of innovation affected positively the probability of relocation. Dewit et al (2009) show the importance of employment protection, as higher levels of it in the home country discourage relocations. The Eurostat initiated study (Alajääskö, 2009) for 12 European countries

(Hungary was not included) and enterprises with 100 or more employees between 2001 and 2006 found that 16% of enterprises moved some of their business functions abroad i.e. were engaged in international sourcing. This activity was most common among Irish and British companies while German, Italian and Spanish companies had much lower intensity of international sourcing. The destinations of international sourcing were to 45% other EU countries, beyond the EU China and India. Manufacturing enterprises sourced far more than enterprises active in other economic sectors. The main barrier to international sourcing was identified as the distance to clients and to suppliers in physical, legal and cultural terms. In all these respects, the new EU member states, including Hungary provide favourable conditions, low production cost at short distance.

Distance matters more for manufacturing relocations than in the case of information technology (IT) and business process outsourcing (BPO) for which transport costs are negligible but management costs are relatively important. In the mid-1990s, relocating services by European firms targeted cities within Western Europe such as Dublin, Brighton or Barcelona (Morrison, 2010). But as costs have increased, the most popular location shifted first to Central European cities such as Prague, Budapest and various Polish cities (Hardy et al., 2011), and lately further east to locations in Bulgaria and Romania.

Hungary's locational characteristics are similar to those identified in the above literature as attractive for becoming a host country of outsourcing and relocation. It provides good conditions as it borders the EU-15, has good transport infrastructure, relatively low wages and an FDI friendly policy environment at least up to 2010. Disadvantages of Hungary comprise its relatively small size and a relatively small domestic R&D sector.

3. EMPIRICAL METHODS APPLIED TO IDENTIFY RELOCATION AND ITS IMPACTS

Measuring the impact of relocation cannot rely on systematic statistics and standard analytical methods. FDI, foreign trade or employment data are not available for relocating activities but according to countries and activities. Even firm level data do not contain details separately on relocated and non-relocated activities. Thus the empirical literature relies on indirect ways to assess relocation, or more precisely, international outsourcing in a wider sense.

Foreign trade data are most often used, given that relocation is usually connected with increased foreign trade, as spare parts, components, other inputs and ready-made products are transported between countries due to relocations. Campa and Goldberg (1997) showed that in the manufacturing industry of the US, Canada and the United Kingdom the share of

imported inputs were on the increase in the period between 1974 and 1993. Yeats (1998) differentiates parts and components within machinery trade (SITC 7) and finds that trade flows in machinery parts and components constituted 30 per cent of total world trade flows, and growth in their trade was faster than that of total world trade. Using the same methodology, Ng and Yeats (1999) and Kaminski and Ng (2001) show the increasing share of trade in machinery parts and components in South-East Asia and in Central and East Central Europe, respectively.

Foreign trade data can be combined with other data in order to grasp more correctly the share of relocated production. Hummels et al. (1998) use the notion of vertical specialisation and input-output tables of nine OECD countries in order to show, that production fragmentation is more significant in smaller countries than in larger ones. Moreover, vertical specialisation increases the most in those sectors (machinery industry, chemicals), which have the highest export growth rates. Hummels et al. (2001) calculate the amount of imported inputs included in exported goods by using input-output tables. They identify not only direct but also indirect imported inputs incorporated in exported goods. Input-output matrices can also be applied to distinguish between domestically produced and imported inputs, thus trying to trace the fragmentation of production and the part of intermediate goods imported from abroad (Amiti and Ekholm, 2006). Here the problem is with the absence of detailed data on the source of inputs and thus proportionality is assumed, meaning that a sector uses an import of a product to the same extent as its total use of the product. This latter assumption is challenged by Winkler and Milberg (2009).

A further empirical approach is to use firm-level data, in certain cases combined with other datasets. For example, Moser et al. (2009) used German firm level data for tracing the employment effect of relocations, Görg and Hanley (2011) did it for Ireland, for Japan Ito et al. (2008) used this type of data. In other instances, firm-level data originate from specialised surveys. For example, Marin (2006) used a survey of German and Austrian companies, which invested in Eastern Europe in order to study the determining factors and impact of relocations in this relation. Bachmann and Braun (2011) used a dataset for Germany, based on individual level data from the Institute for Employment Research, which was then combined with industry level data on intermediate product imports. Jabbour (2010) uses data from the 'International Intra-Group Exchanges' survey, which provides information on captive offshoring and offshore outsourcing activities of French manufacturing firms in 1999 and contain data on imported input and source country as well as the input's industrial classification. This dataset is combined with firm characteristics provided by the annual firm survey of the Ministry of Industry. Moreover, company panel data combined with either input-output tables or with industry level data including data on the import of intermediate inputs are used among others by Farinas and

Martín-Marcos (2010) for Spain or by Görg et al. (2008) for Ireland. There are papers, which use exclusively company survey data, for example Wagner (2009) for Germany. A further approach, addressing the problem of the relocation's impact on wages in the home country uses datasets of wages at the level of the individual worker (Geishecker, 2008; Munch and Skaksen, 2009). Data on the tasks carried out by individual workers are used for example by Görlich (2010).

While results of the above empirical studies differ on the extent and size of relocation (which is also named differently by the authors), all agree in the fact, that this phenomenon grew dynamically starting from the second/third quarter of the last century and accelerated starting from the 1990s. On the other hand, almost all of them call the attention to the relatively limited impact of the relocation process in home countries. But there is an agreement among the majority of researchers that relocations exercise a downward pressure on the relative wages of the unskilled in the home countries. However, an overall negative net employment impact is not supported by empirical evidence, i.e. usually more jobs are created in the wake of relocation in the home country than are lost in connection with it.

The short methodological review reveals that FDI, trade, employments etc. data can be used to provide indirect information on the extent and impact of relocation. In all cases it is almost impossible to differentiate between relocation-related investments, trade or job creation/loss and non-relocation related changes in these data. In addition, some standard problems of reliability concerning FDI and foreign trade data apply (Sass and Fifeková, 2011). Moreover, the literature focuses on outward relocation and the impact on the home country while almost no attention is paid to the host country perspective.

4. RELOCATION DATABASE ON HUNGARY

In this paper we use a different approach from the above listed ones as we rely on direct company information. We compiled a database on declared relocations realised through FDI to and from Hungary, based on information from the economic daily *Világgazdaság* for the nine-year period between 1 January 2003 and 31 December 2011. Further Hungarian economic newspapers or journals, and the balance sheets and websites of the companies were used to complete the database as much as possible.

Declared relocation means, that either the piece of news says explicitly, that there is a transfer of production capacities from/to another country, or there is information about a capacity extension in one affiliate parallel with a capacity reduction in another, or there is a capacity extension in one affiliate, while other affiliates' capacities do not change. (This definition of relocation is in line with Veugelers, 2005.) Only the relocation projects of

foreign investors have been included, not those by Hungarian companies. Announced investments in Hungary with no additional information about the impact on foreign sites were not included in the database.

The following information for each relocation case has been collected if available: date of announcement (or of newspaper article), name and nationality of the investing or disinvesting company, sector of investment or disinvestment, location in Hungary, activity carried out in the relocated company, country of other foreign location involved, labour market impact meaning the envisaged number of jobs created or lost due to the relocation investment. Employment data refer in some cases to the immediate job creation or loss, in others to the total number of jobs created or lost due to the given project in the course of several years.

The method of identifying relocation projects is principally identical with those applied by fdimarkets.com, a subsidiary of Financial Times Ltd. This source also relies on press reports for identifying greenfield investment projects and their characteristics. Therefore the data on Hungary in fdimarkets.com are comparable with the inward relocation data in our sample. As relocations take place in activities manufacturing and tradable services these activities have been selected from fdimarkets.com for reference.

The methodological justification for our approach follows from Sturgeon et al. (2006) and Kirkegaard (2005) who suggested that in order to get a better insight into the relocation process, both qualitative and quantitative research, and especially the combination of the two must be carried out. They propose that qualitative research and “field-work” in the form of sector or company case studies and analysis of databases from media reports, company questionnaire surveys, interviews and other sources should be used for getting a clearer picture about changes in the international division of labour through relocations.

It must be admitted that numerous methodological problems arise in connection with such a methodological approach. While in the overwhelming majority of cases it can be decided quite straightforwardly if the project in question is a relocation of capacities, there are projects which contain both new and relocated activities which cannot be separated. However, this problem of mixing relocated and non-relocated activities is understandably less present here than in research using macro data. Another problem arises due to the use of the number of projects, as information on the invested capital is usually missing. This may over- or under-estimate the importance of one or the other relocation in sectoral or annual comparison as the project sizes may differ from each other substantially. Moreover, a selection bias may also be present: we collected our data from economic dailies, which for sure report on large projects, but some smaller project may have been ignored by the sources. Nevertheless we found news on relocations affecting even only a few jobs, and there were cases where no job creation accompanied the relocation of activities. Another eventual

disadvantage can be that in newspaper articles usually preliminary intents of companies are reported, thus they may be over- or understating the real number of jobs created. However, because we stream only for an approximation of the net job effect, we can overlook this problem.

In spite of some shortcomings, our approach and results can be a good first hand source for supporting (or contradicting) the findings of econometric analyses. Moreover, our research is more or less unique in the field of analysing developments in a host country, as this type of research is largely missing from the literature. (As an exception see e.g. Rojec and Damijan, 2008.) To our advantage, there is no negative sentiment attached to the term “relocation” in Hungary (mainly because the country is a net gainer from the process), that is why in the news it is usually reported explicitly when a given project is relocation (see Piotti, 2007 on a different practice in the home country Germany).

5. CHARACTERISTICS OF RELOCATIONS TO AND FROM HUNGARY

In the period for which this analysis is made, 2003–2011, Hungary got already the attribute “fully functioning market economy”, and joined the European Union in May 2004. Thus in the analysed period capital and trade flows were fully liberalised between Hungary and its most important trading partners. By that time Hungary had attracted a large amount of FDI through privatization related acquisitions and greenfield investments.

The FDI stock as a percentage of GDP reached 51.3% in 2003, the second highest ratio among the new EU members after Estonia. FDI inflows to Hungary peaked in 2005 subsided in the following two years and suffered a major setback in 2009-2010 in the wake of the financial crisis. FDI stock in percentage of GDP increased only marginally, to 65.6% in 2011 which was third after Estonia and Bulgaria.

The number of greenfield projects in the *fdimarkets.com* database peaked in 2006 with 251 cases, fell to 113 in 2009 and recovered to 151 in 2011. The size of the projects, measured by invested capital and job creation, became much smaller after 2008 than they were before. This was the common pattern in the new EU member states. It is also worth noting that the number of greenfield projects Hungary received in manufacturing declined less than the overall number and tradable services attracted more projects in later years than before 2008. The number of projects in manufacturing and tradable services, as recorded by *fdimarkets.com*, was around 150 in 2003-2007. It subsided below 100 in the following two years before recovering to that margin in the two latest years.

5.1 RELOCATIONS IN HUNGARY

By looking at newspaper resources as described above we have identified 324 declared relocation cases in the analysed period, 282 to Hungary and 42 from Hungary. The balance of the number of relocations to and from Hungary was positive throughout the 2003-2011 period. The number of inward cases was around 25 in the years 2004-2009 and significantly higher in the years 2003, 2010 and 2011 (Table 1 and Figure 1). The post crisis years brought significantly more relocations to Hungary. The number of outward relocations was highest in 2005 with 9 cases; it was low in 2007 and 2008 but increased again in 2009-2010.

Table 1

Number of relocation projects to and from Hungary

	2003	2004	2005	2006	2007	2008	2009	2010	2011
to Hungary	39	24	24	28	15	25	27	41	59
from Hungary	4	2	9	6	3	3	7	5	3

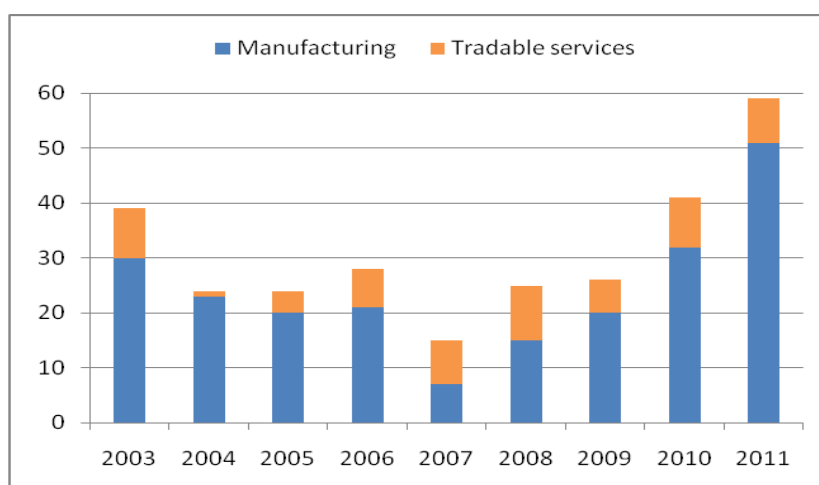
Source: data compiled by the authors

Inward relocation behaved quite differently from FDI inflows and the number of greenfield projects in manufacturing and tradable services. The number of relocations subsided in Hungary already in 2007 before the financial crisis. In fact, Hungary's economic growth changed to low gear already in that year due to fiscal consolidation which proved necessary ahead of other countries due to high fiscal deficits and public debt. Also FDI inflow fell which was against the global and regional trend indicating increased risk perception confined to this particular country.

The number of relocations to Hungary recovered and reached an eight-year peak in 2010, followed by a new peak in 2011. Most probably in 2008-2009 the negative demand effect was stronger in guiding relocation decisions, later the substitution effect has grown more robust although also increasing demand in the core EU countries could have played a role. It is worth noting that while the number of relocation projects increased above the pre-crisis level, FDI and the number of new projects did not recover (see more in the section on the impact of the crisis on relocation).

Figure 1

Number of relocation projects in manufacturing and tradable services



Source: data compiled by the authors.

Relocation takes place in two main groups of economic activities, in manufacturing and tradable services (figure 1). The decline in the number of projects in 2007-2008 was more pronounced in manufacturing and also the recovery in 2010-2011 was driven by this sector. The effect of the crisis was thus stronger in manufacturing while services were more resilient. This indicates that manufacturing responds stronger to demand effects, while services are mainly driven by substitution effect which is in line with the nature of the two sectors.

Table 2

Share of manufacturing projects in the number of relocations and greenfield projects in manufacturing and tradable services

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Relocation	76.9	95.8	83.3	75.0	46.7	60.0	74.1	78.0	86.4
Greenfield	68.5	60.4	62.1	58.8	66.4	54.2	50.0	63.4	59.8

Source: *fdimarkets.com*

The share of relocations in the number of greenfield projects was one fourth in the nine years as a whole, lower in years with high number of greenfield project and higher in the crisis years. Fluctuations in the number of greenfield projects was usually determined by manufacturing while the number of services sector projects was more flat over the years. A shift to tradable services cannot be determined either in case of greenfield investments or relocations.

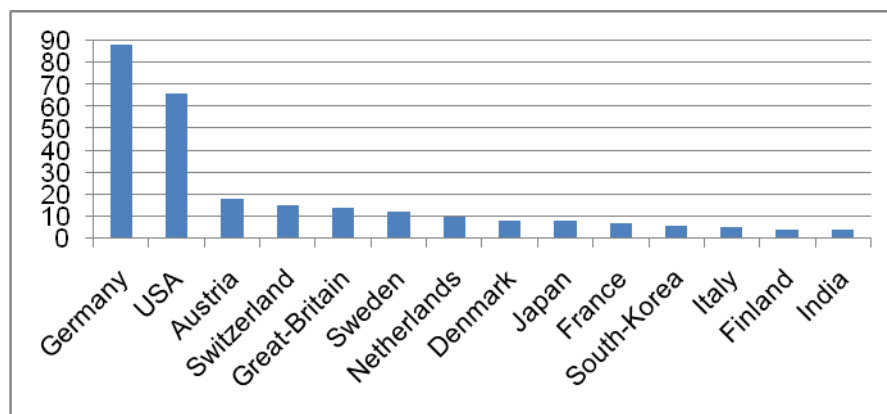
5.2 CHARACTERISTICS OF RELOCATIONS TO HUNGARY

5.2.1 The nationality of relocating companies

The company-level information in the relocation database allows for identifying the final nationality of the relocating companies. This is an advantage compared with FDI statistics containing information on the immediate owner of a foreign affiliate, which in many cases may be different from the final owner. Companies invest indirectly via other countries for various reasons, like tax optimisation or investing the profits of another affiliate abroad or because an affiliate knows better the target market than the parent company. (As an interesting case, note that the US-German GM/Opel is registered as a Spanish investor in Hungary!)

Figure 2

Nationality of companies relocating to Hungary (2003-11, number of projects)



Source: data compiled by the authors.

Note: the nationality of the final investors is taken into account; 11 cases have “combined” ownership, which are counted as 0.5 for the participating economies.

According to the (final) nationality of relocating investors (Figure 2) German multinationals are the main relocating companies to Hungary responsible with almost one third of all relocations (88 cases). They concentrate on manufacturing relocations, while they have set up only six business services projects. Compared with other investors, they transfer relatively frequently R&D activities to Hungary (3 projects plus one with mixed German-Finnish ownership out of the 11 R&D projects).

US multinationals are second following Germany in relocations to Hungary with almost one fourth of the cases. They relocate manufacturing activities when they restructure their European production structures. The US is first in terms of business services relocation

projects with at least half of the 17 projects. These relocations come mainly from extra-European locations (first of all US, but even the Philippines and India). In at least five such cases, US-based capacities were transferred to Hungary. This underlines the already mentioned fact that business services are much less sensitive to distance and transportation costs compared to manufacturing activities.

Austrian companies are in the third place (with a large distance from the US) among the owners of relocation projects in Hungary. Swiss multinationals, number four, relocated almost exclusively manufacturing activities to Hungary, mainly in the automotive sector. British investors became more active only relatively recently, but they have caught up in terms of the number of projects with multinationals from other countries. Beside other European countries and the US, Asian multinational companies, mainly from Japan and South Korea relocate to Hungary. One or two affiliates arrived also from India, Israel and China more recently.

There is a certain sequencing among TNCs of various nationalities in their relocation activities affecting Hungary. First came German, US and Austrian investors, British investors started later and TNCs from India, Israel and China appeared only at the end of the analysed period. This is in line with the sequencing of FDI in general. Among the Scandinavian investors, Finnish and Danish multinationals started relocations to Hungary from around 2005-6, while their Swedish counterparts were continuously active during the analysed period. This latter may be partly due to the Gripen-deal that involved offset transactions in exchange for fighter jets mainly in the form of foreign direct investments realised by Swedish multinationals in Hungary.

Box 1

Company strategies, relocation types

We can document “stages” of relocations or stepwise relocations, when the multinationals carried out the transfer of capacities in more than one step. For example, the French Schneider (electronics) relocated certain activities in two steps, first in 2007 and second in 2010. In the second relocation, capacities at already existing Hungarian plants(in Zalaegerszeg and Gyöngyös) were extended. Similarly, the German Continental AG transferred various production and R&D activities to Hungary in several steps in 2003, 2004 and 2009.

We can also trace how multinationals restructure their production geographically. For example the Dutch Philips relocated parts of its TV-sets production from France to Székesfehérvár in 2003, then established an Eastern European regional centre in Budapest in 2006. In the next phase it transferred its European TV-sets production, except for the development activities, from Brugge (Belgium) to Székesfehérvár in 2009. This was followed by other activities relocated from Finland, France and Turkey to Tamási in 2010. Meanwhile the same company relocated the production of CRT monitors from Szombathely to China in 2003. As a recent

development, Philips reduced substantially employment in its Székesfehérvár plant in March 2012. This investor kept concentrating on low-cost production which made it necessary to move from the core of the country to less developed regions or further to lower cost countries.

Delphi Calsonic (USA) relocated the production of electronic components to Hungary in August 2008 and at the same time it transferred certain production activities to Poland and Slovakia. It uses the new CEE production plants to supply Western European markets from low costs locations and also benefits from economies of scale.

The German company Bosch relocated its automotive components production from France to Eger, Hatvan and Miskolc in June 2008, a few days later it announced the transfer of certain R&D capacities from Germany to Budapest, which latter was further extended at the end of the same year. Here one can see a sequencing of relocation beginning with low value added products followed by more skills intensive segments. In 2010, it transferred the production of car generators from Wales to Miskolc and Hatvan.

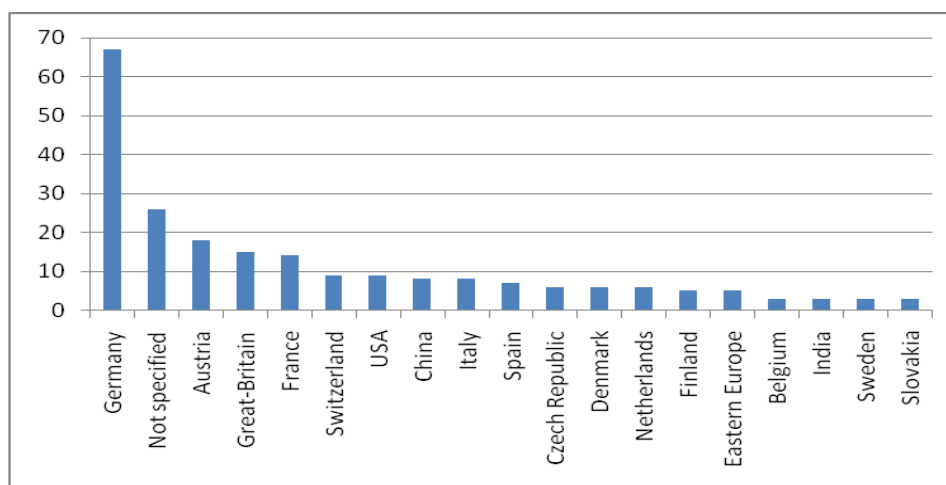
Source: the relocation database compiled by the authors

5.2.2 Foreign locations affected by relocation to Hungary

The source country of relocation often differs from the home country of the foreign investors. Relocations to Hungary came mainly from West European locations (Figure 3). The dominance of EU-15 in Hungary's parts and components trade was underscored by Kaminski and Ng (2001) and at least a part of this may easily be connected to relocations. Behar and Freund (2011) also show the importance of trade in intermediates between the EU-15 and the NMS, which can be at least partly induced by relocated capacities. In our database Germany, the top economic and trade partner of Hungary stands out with 67 cases, followed by Austria, Great-Britain and France; in the case of the latter three countries, the number of projects remains below 20 for each country. In addition, at least a part of "not specified" West-European locations may be also found in Germany.

Figure 3

**Affected foreign locations in the analysed relocation cases to Hungary
(2003–2011, number of projects)**



Source: data compiled by the authors.

Note: information is available on 221 cases; more than one location may be affected in certain cases.

European countries apart from Germany were affected by less than 10 cases each in the analysed 9-year period. Even Central and Eastern European countries are present on the list, in the case of which relocations can be the result of reconfiguring or concentrating European capacities with the aim of benefitting from economies of scale.

USA and China are two outside-Europe locations, which are affected in a relatively high number of cases (9 and 8, respectively). Even India is present on the list, with 3 cases. However, the low number of extra-European locations underscores the fact that relocations are mainly intra-European transactions even if the company undertaking the relocation resides outside Europe. The most obvious example is the USA which is home of the investor in over sixty relocations, but only 9 relocations came from the US.

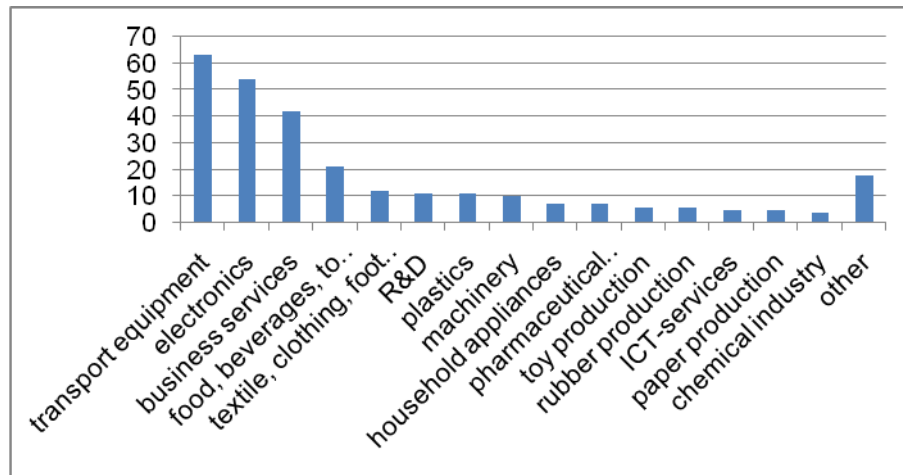
5.2.3 Sectors affected by relocations to Hungary

The two sectors with the highest number of relocations are in manufacturing (Figure 3), the automotive and the electronics industries. (These two sectors are so much intertwined, that in some cases it is impossible to categorise the activity in question, as much of the electronics industry produces car-parts.) German carmakers are the most frequent investors in Hungary; it is mainly automotive parts and components production in which relocation flourishes. For example the US Delphi, the Swiss Saia-Burgess, the German Robert Bosch, SAPU or Continental AG relocated substantial capacities to Hungary. Relocations involve

mostly a European reconfiguration of capacities, which can be attributed to the sensitivity to distance.

Figure 4

Sectors of relocations to Hungary (2003-2011, number of projects)



Source: data compiled by the authors.

The prominent place of the automotive and electronics in relocation is similar to previous findings for the period 2003-2005 (Hunya and Sass 2005), however, given the nature of our database, we could show the high level of interrelatedness between the two sectors. The prominence of the two sectors is also in line with Kaminski and Ng (2001), who analyse manufacturing trade and show that Hungary is specialised in the production of electronics and automotive components. Further analysis of the Hungarian electronics sector is provided by Szalavetz (2004), Sass (2006) and Csonka (2011), and all authors underscore the importance of foreign direct investments and relocations in shaping the developments in this sector. Behar and Freund (2011) show the importance and increasing complexity and sophistication of intermediates trade in machinery and transport equipment categories between EU-15 and NMS. Nunnenkamp (2006) or Jürgens and Krzywdzinski (2009) show the relocation of assembly operations and offshoring of parts production in the German automotive sector to Central Europe, including Hungary. Moreover, this is in line with the findings of Rojec and Damijan (2008), who analyse manufacturing sectors and note, that the new member states are targets of relocations in medium tech and in lower end segments of high tech industries. Levasseur (2010) points out the high possible presence of international outsourcing (offshoring) in the case of the Slovakian automotive industry.

Relocation in business services, the third most important activity, started in Hungary only after 2000. (For more details see Gál 2007, Sass 2008, or Hardy, Sass, Fifekova 2011.) In a wider sense this activity includes IT-services, financial services, HR-services, accounting, etc. Hungary, together with Poland, Romania and the Czech Republic, is among

the prime hosts among the new members of the European Union for relocations in this sector. A specificity of this activity is, that we could show on the basis of our database that global reorganisation of production is more frequent, than in manufacturing activities – a relationship which is not addressed by other studies. Jobs are transferred in business services also from outside of Europe not only from inside. To name a few companies, Albemarle, Celanese, IBM or Lexmark from the US, Avis, British Petrol, BT, Vodafone and Diageo from Great-Britain, Deutsche Telekom, Lufthansa and T-Systems from Germany all have established service providers in Hungary during the analysed period.

Food, beverages and tobacco is the fourth most important industry involved in relocation although with much fewer cases than the previously discussed ones. The features of the cases indicate that this industry is subject to a reorganisation and concentration of production structures producing for the European market. There are cases, where the European production was concentrated to Hungary (in 2010 the Austrian Ed Haas moved the PEZ-production from various locations) resulting in a relocation to Hungary, and also where production was removed from Hungary to concentrate it elsewhere (the US Kraft Foods relocated its Hungarian production to Austria and Slovakia in 2004).

Traditional labour intensive sectors, such as clothing and footwear are affected by relocation to a lesser extent. Only 12 cases to and 4 cases from Hungary can be attributed to these industries. Having a closer look at these projects reveals, that activities with higher value added have been relocated to Hungary (e.g. preparation of individually designed and hand-made boots by the French Heschung in 2005), while those with lower value added are relocated to other, lower cost countries, for example to Romania (the Austrian Triumph in 2005) or Tunisia (the German Falke in 2010). Thus we could show that the expectations of Rojec and Damijan (2008), that these activities will be relocated outside the European Union, mainly to North-African countries, have been realised only partially, as Romania, not an EU-member up till 2007, still offers competitive labour cost for this type of activities.

R&D appeared among the top target sectors of relocation more recently, in line with global processes (see e.g. Sachwald, 2008 or Kalotay, 2005). The majority of R&D relocations follow the move of production to Hungary indicating a need for geographical closeness between production and related R&D. (In the case of German R&D relocations, the preference of nearshoring to Eastern European countries over Asia during the crisis is also underlined by Kinkel and Som, 2012.) Co-location may be the case for Audi, Bosch, M-Telekom, Knorr-Bremse, but there are relocations, which can be explained by the shortage of the required highly skilled personnel in the source country (though the importance of this motive is gradually fading according to Kinkel and Som, 2012) and/or lower relative wages in the host country. (Such efficiency seeking motives were found to be dominated during the 2007-9 period for German companies in relocating R&D by Kinkel and Som, 2012.) On the

basis of our database, we could show the predominantly “European nature” of relocations in R&D, as mainly European multinationals locate their R&D units to Hungary.

5.2.4 The labour market impact of relocation

While the database allows only a rough estimate of the number of jobs created, we can state with certainty that it obviously remains limited (Table 3). As far as relocations to Hungary are concerned, data on the number of jobs created was available for 222 out of the 282 cases of relocations to Hungary of which there were five cases in which no new jobs were created. Only in four cases is information available on the number of jobs lost in the source country and the number of jobs created in Hungary. The number of new jobs in Hungary is usually lower than those lost in the other location indicating a simultaneous reorganization and productivity increase. For example, the British Barclays Bank laid off 1800 employees in Great-Britain in 2008 and created only 1700 in Hungary. In another relocation project the German Carl Zeiss cancelled 270 jobs in Germany and created 100 in Hungary in 2006. This indicates that labour cost may not be the only motive of relocation and that productivity improvement may be achieved in a new location. Altogether more than 54000 jobs were created through the relocation projects in nine years, about one-fourth of that coming from Germany.

Table 3

Top country of origin of jobs created through relocations in Hungary (2003-2011)

Country	Number of cases	Approximate number of jobs created
Germany	52	12500
Western Europe	15	4970
Great-Britain	11	4600
France	7	2000
Denmark	5	1300
USA	8	1300
Switzerland	8	950
Finland	3	800
China	4	800
Italy	5	780
Austria	13	670

Source: data compiled by the authors.

Note: including only cases where data about the number of jobs is available; when more than one country was given, the number of jobs were distributed equally between them.

Thus the largest “exporter” of jobs to Hungary is the largest European economy Germany, followed by Great Britain, while France, Denmark and the USA are also relatively important source countries. The dominance of Germany could be expected first, due to its geographic closeness, second, the traditionally strong economic ties between the two countries, and third, because of the large difference in size and labour costs between the two countries. German relocation projects were usually smaller as they were in highly productive manufacturing sectors while some other countries relocated more in labour intensive services. In the case of the US, five of the eight projects operate in business services. It is interesting to note the relatively large size of the projects (low number of cases and a high number of jobs transferred) relocated from Finland and China.

Table 4

Top job creating sectors through relocation to Hungary (2003-2011)

Sector	Number of cases	Approximate number of jobs created
Electronics	46	12100
Automotive	31	9200
Business services	37	8700
Plastics	11	2500
Machinery	5	2010
Food, beverages, tobacco	11	1830
R&D	10	1213
Pharmaceuticals	5	1130
Household appliances	3	1070
Medical appliances	2	900

Source: data compiled by the authors.

As expected, the top job creating sectors are electronics, where well-known multinationals, such as Epcos, Jabil, Philips, Kontavill, Schaffner, Clarion etc. transferred capacities to Hungary (Table 4). Second, in close relation with the former, is the automotive sector. A good example is the German Robert Bosch, which has three countryside plants producing electronic components for cars and an R&D centre in Budapest. Business services are also important for job creation, providing opportunities in skilled or at least mid-skilled jobs for university graduates speaking at least one, but usually more than one foreign language (e.g. Hardy et al., 2011)

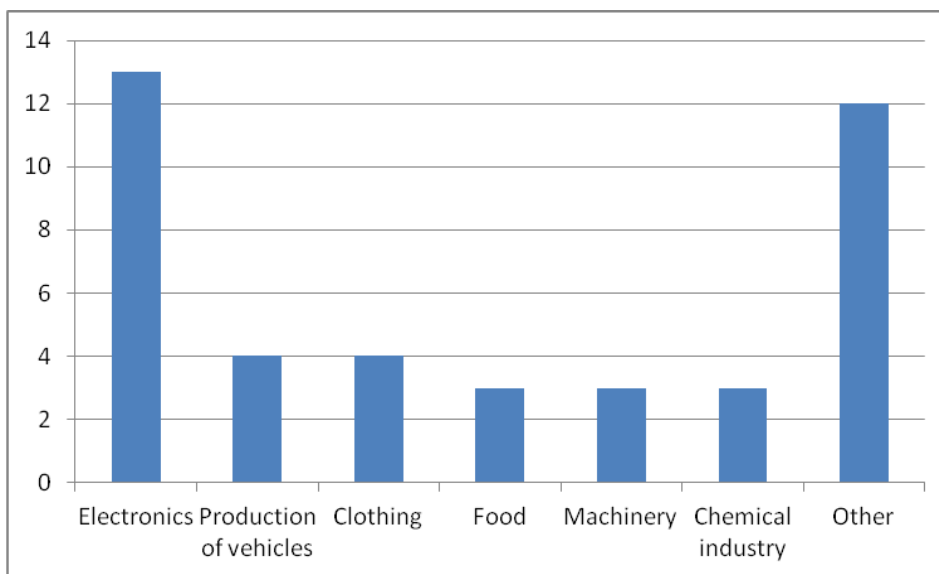
The overall number of relocated jobs from Germany and other Western European countries is surprisingly low, compared to both the total number of employees in Hungary and that in the affected foreign locations. Thus our results are in line with conclusions of other research (Marin, 2009 or Jensen et al., 2006) namely that source countries loose relatively few jobs.

5.3 CHARACTERISTICS OF RELOCATIONS FROM HUNGARY

Hungary is a net receiving country in terms of relocations, and the number of relocated foreign affiliates from Hungary is relatively low. This indicates that investors are not very mobile. As far as their number is concerned, it was higher in 2005 and 2009 than in other years. Just like in the case of the relocations to Hungary, here again US and German multinationals are the most active (Figure 5).

Figure 5

Sectors of relocations from Hungary (2003-2011, number of projects)

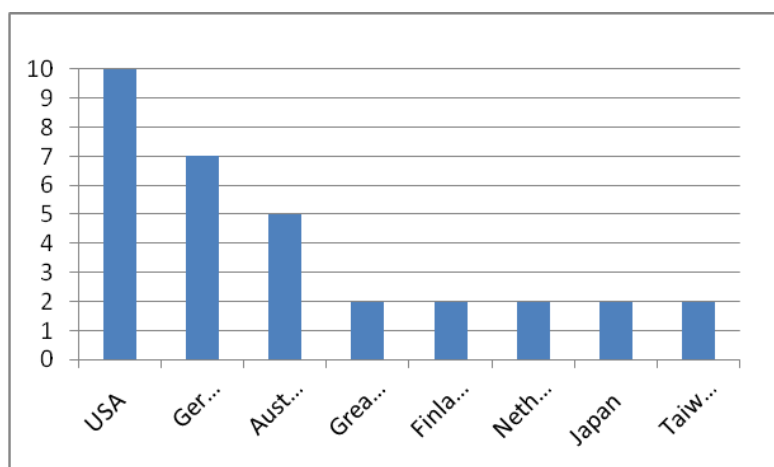


Source: data compiled by the authors.

However, US multinationals take the lead here. According to our database, US subsidiaries are more mobile as parts of global networks and more frequently in electronics than German subsidiaries integrated into European production networks. The share of Austrian companies is also higher in relocations from Hungary than in relocations to Hungary. With two cases each, two Asian countries show up, namely Japan and Taiwan.

Figure 6

**Nationality companies relocating from Hungary
(2003-2011, number of projects)**

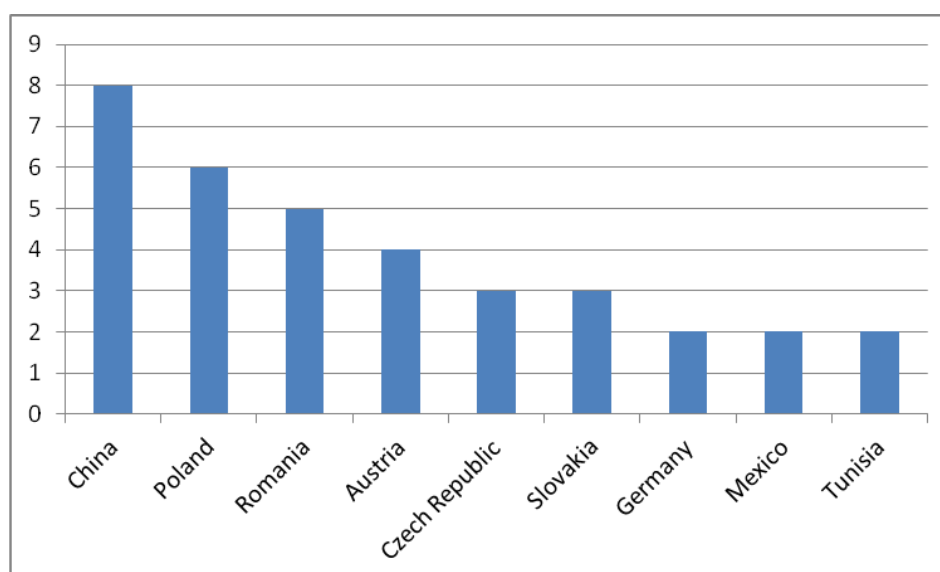


Source: data compiled by the authors.

The sectors affected by relocations from Hungary are very similar to those in which relocations to Hungary were realised. One main difference is the outstanding position of the electronics sector (Figure 6) with by far the highest number of cases. On the basis of our database, this sector is the most mobile. The automotive sector (production of vehicles) is much less affected by relocation from Hungary. Actually the number of the automotive sector cases is the same as that of the traditional labour intensive clothing sector, which has a relatively few cases of relocation to Hungary. Another important difference between the two directions of relocation is, that business services were not relocated from Hungary (there was only one such case, where capacities were concentrated from several NMS to Poland). This underlines the fact that Hungary (and other countries in the region, especially Poland, the Czech Republic and Romania) are hosts to relocated capacities in services which are not mobile (Hardy et al., 2011).

Figure 7

**Foreign locations affected by relocations from Hungary
(2003-2011, number of projects)**



Source: data compiled by the authors.

China stands out as the main destination for relocations from Hungary (Figure 7). Out of eight cases, six involve electronics production and these are usually relatively large projects causing a high number of job losses to Hungary. China is followed by European locations like Poland and Romania on the basis of the number of projects, but these projects are usually smaller in employment size. Here again, the presence of other European locations with similar to Hungary wage levels in Central and Eastern Europe indicate the impact of corporate reorganisation processes. For example, Poland received three relocations in the chemical sector while to Romania, footwear, clothing, automotive and electronics production was transferred (one project each). In the case of the footwear, clothing and electronics projects, it is clearly the lower wages of Romania, which explain the movement of capacities. These are followed by other extra-European locations, which attracted paper and plastics production (Mexico) and clothing (Tunisia). Even locations such as Brazil (electronics), India (automotive) or Malaysia (electronics) are present with one relocation project each.

As for the number of jobs lost, out of the 42 relocations from Hungary information is available for 36 cases. The total number of jobs lost is around 7800, of which almost one-third went to China. As it was already mentioned, China is host to a few very large projects in terms of jobs losses one with 900 and another with more than 500 jobs. Also the relocations to Brazil and to Malaysia resulted in a substantial loss of jobs: both meant a transfer of more than 500 workplaces from Hungary.

6. IMPACTS OF THE RECENT CRISIS ON RELOCATION

The impact of the financial crisis on relocation involves two contradictory processes. First, companies are induced to relocate less as the demand for their products is falling steeply – called the “demand effect”. Second, increased competitive pressure stimulates companies to relocate and outsource more in order to reduce costs more aggressively and thus increase their competitiveness – the “substitution effect”. (Gereffi, 2010) The net impact then depends on the relative sizes of these two effects.

There are only few studies which analyse explicitly the impact of the crisis (or of the business cycle in general) on international outsourcing. Levasseur (2010) examines the impact of the business cycles on international outsourcing and finds that multinational firms adjust their outsourcing demand according to the business cycle and thus they may be responsible for a part of the business cycle volatility in the Czech Republic and Slovakia. She also calls the attention to the possibly differing behaviour of European and non-European multinationals in that respect. Bergin et al. (2009) analyse the same phenomenon in the case of the Mexican maquiladoras, and find that US firms “export” to Mexico a part of their employment fluctuation during the business cycles.

Other approaches use mainly the theoretical framework of global value chains (GVCs), when they try to show how the global crisis is affecting international production and how it is transmitted through the channels of international trade. For example, already early on into the crisis, GVC-related factors were included in the list of the possible transmission mechanisms (see among others Baldwin, 2009 or Milberg and Winkler, 2010). It was hypothesised that the organisation of international production in GVCs caused a bigger drop in trade than in GDP. Empirical papers found direct or indirect evidence that involvement into GVCs could play a role as a transmitter of the crisis, however, the sign (positive or negative) and the size of that impact differed from study to study. (See e.g. Cheung and Guichard, 2009, Escaith et al., 2010, Behrens et al. 2011 and Stehrer et al. 2011.) As for Hungary, this country had the highest grade of involvement in GVCs measured by Cheung and Guichard (2009) in an OECD comparison, and by Stehrer et al. (2011) in an EU comparison. These papers call the attention to the two contradictory impacts of GVC-involvement during the crisis: GVC may act as transmitters of the crisis, at the same time they can provide a stabilisation effect as well.

Table 5

**Number of relocation projects to Hungary and greenfield projects in Hungary
(manufacturing and tradable services) 2003-2011**

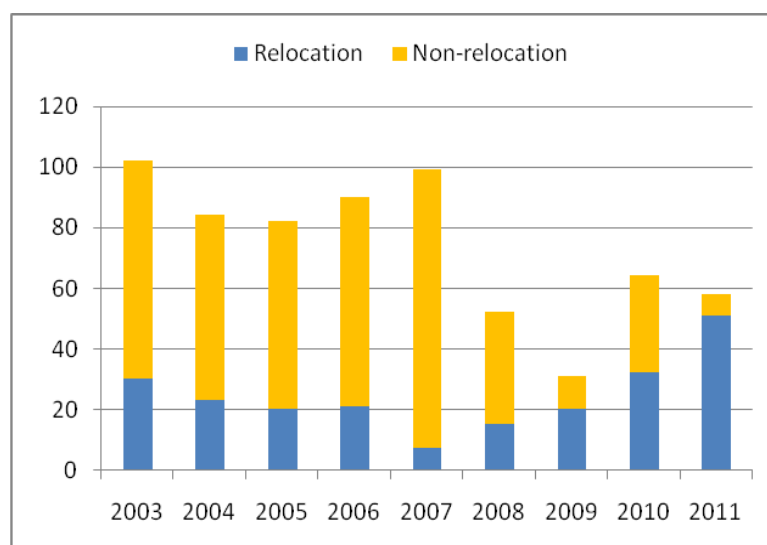
	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
Number of relocations to Hungary	39	24	24	28	15	25	27	41	59	282
Greenfield	149	139	132	153	149	96	62	101	97	1078
Relocation % in greenfield	26.2	17.3	18.2	18.3	10.1	26.0	43.5	40.6	60.8	26.2

Source: data compiled by the authors and fdimarkets.com

The 2008-2009 crisis is responsible for a setback in FDI to Hungary and also for the diminished number of greenfield projects. The number of relocations increased at the same time. We compare the number of relocation projects with the number of new investment projects (figures 8 and 9) in manufacturing and tradable services. In both sectors, the number of projects registered in 2008-2011 was below those in 2003-2007 but the decline was stronger in the case of manufacturing than services. Most remarkably, the majority of manufacturing greenfield projects in the years 2009-2011 were relocations which indicates the overwhelming importance of the substitution effect. As to services, the total number remained lower than before the crisis and the number of relocations did not change only its share rose a bit to about 20% in 2008-2011 from about 10% in the preceding period.

Figure 8

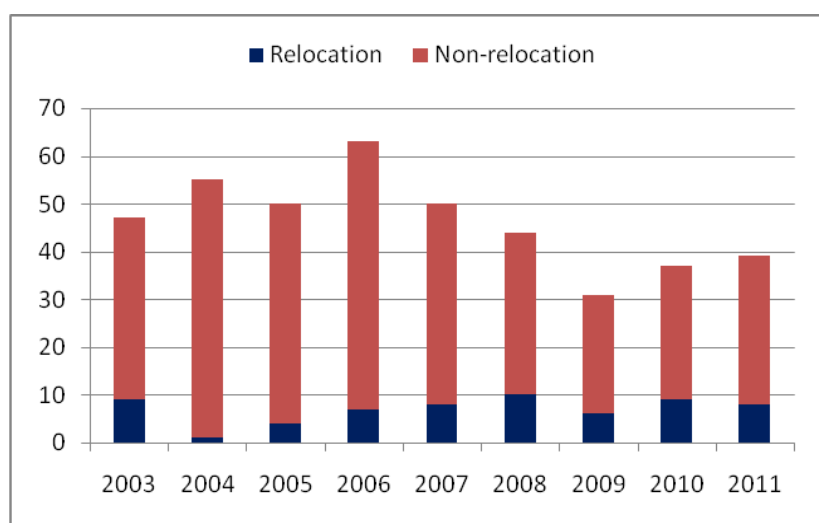
Number of relocation and non-relocation projects in manufacturing



Source: figure 1 and www.fdimarkets.com

Figure 9

Number of relocation and non-relocation projects in tradable services



Source: figure 1 and www.fdimarkets.com

Another specific crisis-related feature of relocation is the return of production from abroad (back-shoring or re-shoring). Our database indicates that this has become more frequent during and after the crisis years. There was only one clear-cut such case in 2005, another one in 2006, but at least two in 2010 and four in 2011. Back-shoring usually took place from a far-away location to one close to the parent company namely to Hungary. Märklin back-shored partly to the home country partly to Hungary while some other labour intensive production returned to the EU (Box 2).

Box 2

Back-shoring cases

German Märklin, a producer of model trains relocated back its production from China to Germany and Hungary in 2010.

Josef Seibel, a German shoe producing firm, transferred its production from China, India and Moldova to Hungary and to Romania. It chose a Hungarian partner for that (Szamos, Hungarian shoemaker) and located the Hungarian and the Romanian plants close to each other along the two sides of the common border in Csenger in Hungary and Oradea in Romania. The explanation for this backshoring was problems with discipline in meeting the deadlines and problems with quality in far-away locations.

Another case took place in the textile-clothing industry. The German company J.H.Ziegler, a producer of textiles for the car industry transferred back the production from North Africa and from China and other Asian locations to Bábolna in Hungary. They had problems also with

meeting deadlines and with quality. High transportation costs and diminishing Chinese wage advantage over Central and Eastern Europe also played a role.

Source: database compiled by the authors

Looking only at the likely post-crisis development, Gotart, Görg and Görlich (2009) present two views. The optimistic one forecasts a return to business as usual after the crisis meaning that international sourcing will recover together with world trade; exporters of finished goods will rebuild their production networks which were dismantled during the crisis. The more cautious view says that world trade will recover with less international sourcing than before the crisis due to the important sunk costs associated with re-building lost networks. Companies seem to have learned some lessons of their global expansion of sourcing and sophisticated supplier networks. They came to the conclusion to curtail their engagements especially what concerns sourcing from distant suppliers. Differences between company strategies can be rather big, thus sourcing decisions may go into juxtaposing directions.

The findings of this paper suggest that relocations has not stopped but rather intensified after the crisis. There may be still little need for building new productive capacities, the finding the most efficient location for existing capacities is on the agenda.

7. CONCLUSIONS

We compiled a comprehensive company database on relocations to and from Hungary for the period 2003-2011 following the recommendation of Sturgeon et al. (2006) and Kirkegaard (2005) namely that macro-analysis should be supplemented with company level datasets for getting a fuller picture about relocations. This allowed not only to measure the frequency of relocation over nine years but also to deal with specific characteristics of relocation from a host country point of view.

Our findings confirm the results of other researchers concerning the sectoral composition of relocation dominated by the very much interrelated automotive and electronics sectors. We also identified a more recent increase of relocation in business services, which is not yet indicated by the CEE related literature. We could show the dynamism of the relocation process in terms of the affected sectors, starting out from traditional labour intensive sectors, which now are more present in relocations from Hungary than to the country. We showed that R&D is an activity where more recently the number of projects has grown. Our database allowed analysing the composition of relocations in terms of the final owners of the relocating multinational companies. We

found, that these are mainly German- and US-owned. US and Austrian investors have proved more footloose reconfiguring quickly their capacities in response to changes in relative wages, even when the sector composition is controlled for. We could single out some developments in terms of the “timing” of relocations to Hungary, for example the later start of British relocations or the varying start of Scandinavian investors. Relocations affecting Hungary have been mainly inside European processes. Capacities and jobs are transferred mainly from Western Europe to Hungary. In the cases where US locations are affected, the activity is usually business services.

As far as the origin of relocated jobs is concerned, the main job “exporter” to Hungary is Germany followed by Great-Britain. On the other hand, around one-third of jobs lost in Hungary have gone to China. As for the sectors, the largest number of jobs are created in electronics, followed by business services, and automotive, which latter is mainly due to the large automotive projects realised in Hungary after 2009. Overall, we could confirm the findings of other research in terms of the relatively small number of jobs created in Hungary through relocations, and the even smaller number of jobs relocated from Hungary.

As far as the crisis–relocation relationship is concerned, we found increasing relocation activity to Hungary in the recent post-crisis years, in a period when the number of greenfield projects fell. The number of relocation projects and their net job creation indicate that the demand effect dominated before and during the crisis, while after the crisis the substitution effect may have become more important. It may even counteract to and compensate for the negative effects of the fall in demand from the point of view of relocations. We could find evidence for re-shoring or back-shoring as well.

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